

REMARKS

Claims 1, 3 to 13, 22, and 27 are in the application.

Rejection of Claims under 35 U.S.C. § 103 (a).

Claims 1, 3 to 13, 22, and 27 are rejected under 35 USC §103(a) as being unpatentable over De Wille et al. (US 5,597,595) in view of Nakel et al. (US 4,737,375). Applicant respectfully traverses this rejection.

The presently claimed invention is believed to distinguish Applicant's invention over the cited De Wille et al. and Nakel et al. references.

The Examiner states that "De Wille et al. teach a composition containing a calcium compound, specifically calcium glycerophosphate, and an acidulant specifically a mixture of citric and lactic acid (see Col 43 Example 7)."

As previously discussed in Applicant's response of December 1, 2004, the '595 reference does not direct the skilled artisan to achieve a composition having the balancing of the factors as described herein (e.g., calculation of the calcium:acid molar ratio maintenance of the final pH of the composition) for use in reducing tooth erosion. There is no recognition that such a combination of factors would inhibit tooth erosion nor reduce tooth erosion. Instead, De Wille et al. formulates their compositions for the purpose of dietary supplementation.

The molar ratios in claims 1 and 22 recite a range of ratios that are not taught nor suggested by the De Wille et al. patent.

The Nakel et al. patent is cited by the Examiner to teach that there are "two important factors with regard to the beverages and beverage concentrates of the present invention. One is the weight ration of the total acids to calcium. For the purposes of the present invention this weigh ratio can range from 4 to 7 (see col. 5 lines 20-25)". (Page 3, 3rd ¶, Office Action).

The US 4,737,375, Nakel et al. patent relates to beverage compositions containing a defined % weight range of solubilized calcium, and select acid components, the weight ratio of the acid component to solubilized calcium being in the range 4 to 7. The pH of the beverage compositions is not an essential feature of Nakel; it is described as typically

within the range 2.5 to 6.5, preferably from 3.0 to 4.5 for carbonated beverages. See col. 10, lines 19 to 24. The pH in Nakel et al. is dependent upon the weight ratio of the acids. It is not a factor which is considered necessary to change. Nakel et al. discloses a number of Embodiments in the specification. According to calculations (performed as described below), none of these Embodiments disclose a composition meeting the requirements of present claims. For example, Embodiment 2 contains defined weights of citric acid, malic acid, phosphoric acid and calcium carbonate, and has a pH of 4.3 following the addition of carbonated water. The molar ratio of calcium to acid for this Embodiment would be 0.68 which is outside the claimed range of 0.3 to 0.55. The main reason for controlling the acid/calcium ratio in Nakel et al. is to prevent calcium from precipitating from the solution. See col. 5, lines 20 – 33.

Calculation of Example 2 – Nakel

Ingredients	Amount (g)	Molecular Weight
Citric acid (anhydrous)	28.28	192
Malic acid	25.48	134
85% Phosphoric acid	27.70	98
Calcium carbonate	39.03	100

$$\text{Moles} = \text{mass (g)} / \text{molecular weight}$$

$$\text{Moles citric acid} = 0.15$$

$$\text{Moles malic acid} = 0.19$$

$$\text{Moles phosphoric acid (85\%)} = 0.24 (27.70/98 \times 0.85)$$

$$\text{Moles calcium carbonate} = 0.39$$

$$\text{Total acids} = 0.58$$

$$\text{Moles calcium to acid} = 0.39/0.58 = 0.68$$

The Examiner further states that from the teaching of Nakel et al. e.g. that controlling the weight ratio of total acids to calcium, when applied to the teachings of the De Wille et al. one will arrive at compositions that fall within the present claims. This is however, a clear case of hindsight analysis. If you basically said that if double the amount of acid in Example 7 of De Wille et al., then you get a mole ratio of 0.35. Yes, if you double the amount of acid in Example 7 of De Wille et al. you would achieve a molar ratio as claimed by Applicants. But what motivation exists in the Nakel et al. teachings to direct the skilled artisan to do so? It is only upon reading Applicant's specification that one would be directed to do so and that is an impermissible hindsight analysis.

Neither the De Wille et al., nor the Nakel et al. patent is related to tooth erosion. Neither of the two patents teaches controlling the calcium to acid mole ratio within the range 0.3 to 0.55 and controlling the pH in the range 3.5 to 4.5. Neither of them teaches that controlling both factors produces an advantage. Neither teaches that the advantage of doing this is for reducing the tooth erosion potential of the resulting composition. There is no motivation in either reference, alone or in combination to direct the skilled person to do so.

The concept of identifying a composition which is effective against tooth erosion by reference to its calcium: acid molar ratio and their pH in solid or semi-solid compositions is believed to be both novel and inventive over the cited De Wille et al. and Nakel et al references.

Therefore, in view of these remarks Applicant respectfully requests that the rejection to the claims under 35 USC §103 be withdrawn.

CONCLUSION

Should the Examiner have any questions or wish to discuss any aspect of this case, the Examiner is encouraged to call the undersigned at the number below. It is not believed that this paper should cause any additional fees or charges to be required, other than expressly provided for already. However, if this is not the case the Commissioner is hereby authorized to charge Deposit account 19-2570 accordingly.

Respectfully submitted,


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